

# Does Mandatory Attendance Improve Student Performance?

Daniel R. Marburger

*Abstract:* Previous empirical literature indicates that student performance is inversely correlated with absenteeism. The author investigates the impact of enforcing an attendance policy on absenteeism and student performance. The evidence suggests that an enforced mandatory attendance policy significantly reduces absenteeism and improves exam performance.

Key words: absenteeism, attendance, exam, undergraduate

JEL codes: A0, A2

Unlike high school, attendance at most colleges' classrooms is not mandatory. As maturing adults, students are typically given the freedom to make their own choices. They can choose whether to attend class, turn in homework, or even show up for the final exam. From an economic perspective, the issue becomes one of time allocation, as the students choose between competing academic and nonacademic uses of their time.

Results from past studies on classroom attendance suggest that significant absenteeism represents the norm for utility-maximizing college students. Romer (1993), for example, found that roughly one-third of the students in an undergraduate economics class were absent during any class meeting. Marburger (2001) discovered that absenteeism was significantly higher on Fridays, and the percentage of students absent from class gradually increased as the semester progressed.

The relevant question for economic education is whether absenteeism interferes with learning. Not surprisingly, empirical literature suggests an inverse relationship between absenteeism and learning (Durden and Ellis 1995; Marburger 2001; Park and Kerr 1990; Romer 1993). On the basis of the empirical evidence, Romer suggested a controlled experiment to determine if enforcing a mandatory attendance policy improves learning. He suggested randomly dividing the students into two groups: an experimental group whose grades depended, at least in part, on attendance and a control group whose grades did not. One could then detect not only the impact of a mandatory attendance policy on attendance but also on student learning.

My purpose in this study was to extend Marburger's (2001) analysis of the relationship between absenteeism and exam performance. I examined the impact of

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an enforced attendance policy on absenteeism and exam performance. The study was, in essence, a variation of Romer's recommended experiment. Two issues made the experiment problematic. First, absenteeism may be endogenous to the class time slot. Midmorning classes may, for example, be better attended than late afternoon lectures. To isolate the impact of a mandatory attendance policy on absenteeism, the two class sections must be taught by the same instructor and meet in the same time slot. This necessitated that I conduct the study over two semesters.

The need to conduct the study in two semesters created another problem. Ideally, to identify the impact of an attendance policy on performance, I would have had to give the two sections identical examinations. For security reasons, this simply was not feasible. Although I could compare the performances of the experimental and control group on different exams, the results would be inherently questionable.

To investigate the impact of a mandatory attendance policy on learning, I had to recognize the following underlying relationship:

$$\frac{\partial \text{Learning}}{\partial \text{AttendancePolicy}} = \frac{\partial \text{Learning}}{\partial \text{Absent}} \times \frac{\partial \text{Absent}}{\partial \text{AttendancePolicy}} . \quad (1)$$

By isolating on the individual components, I could identify the effect of an attendance policy. I measured the impact of an attendance policy on absenteeism by comparing absenteeism in two sections in identical time slots taught by the same instructor in corresponding semesters. In one section, attendance was not mandatory. In the other section, the university's attendance policy was strictly enforced.

I estimated the second component, the relationship between absenteeism and learning, by following Marburger's (2001) method. I measured the relationship between class absences and the likelihood of incorrect responses to multiple-choice exam questions for the "no-policy" group. By combining these components, I could assess the impact of an attendance policy on student performance.

## PRIOR LITERATURE

Several researchers have attempted to measure the impact of absenteeism on student performance (Romer 1993; Park and Kerr 1990; Durden and Ellis 1995; Schmidt 1983; Marburger 2001). In each study, they found a positive correlation between exam performance and attendance.

Romer (1993) surveyed attendance at all undergraduate economics classes during one week at a large public institution, a medium-sized private university, and a small liberal arts college. His survey results revealed that roughly one-third of the class was absent during any class meeting. Marburger (2001) found daily absenteeism for a principles of microeconomics class to average 18.5 percent. Absenteeism on any given day ranged from 8.5 percent to 44.1 percent. The evidence also showed that absenteeism was highest on Fridays and gradually increased as the semester progressed.

Marburger's (2001) method is particularly relevant to this study. Daily attendance records were kept to track each student's rate of absenteeism. In addition,

multiple-choice exam questions were created after each lecture on the basis of the material covered that day. The data would thus reveal if a student who missed a specific multiple-choice question had been absent from class on the day the material was covered. A probit estimation indicated that a student who had missed class on a specific day was 7.5 percent to 14.6 percent more likely to respond incorrectly to a multiple-choice question on material covered that day than was a student who was present.

## METHOD AND EMPIRICAL RESULTS

### The Marginal Effect of an Attendance Policy on Absenteeism

The first component of this study measured the effect of an enforced attendance policy on absenteeism in two principles of macroeconomics sections taught by the same instructor in two different fall semesters during the same time slot (MWF 12:00). Table 1 shows the means and standard deviations of the characteristics of the two sections. In the fall 2002 semester, I took daily attendance, but the students were told their attendance would not affect their grade (no-policy class).<sup>1</sup> Attendance was also taken in the fall 2003 class. In this class, the students were told the university attendance policy would be strictly enforced (policy class).<sup>2</sup> Because both sections were held in fall semesters during the same time slot and taught by the same instructor, any differences in absenteeism could be traced to the enforced attendance policy.<sup>3</sup>

The summary data revealed significant differences in absenteeism between the two sections.<sup>4</sup> In the policy class, absenteeism in any given class period averaged 11.6 percent. In contrast, average absenteeism in the no-policy class averaged 20.7 percent. The evidence also revealed that the gap widened as the semester progressed. For the policy class, absenteeism averaged 12.5 percent during the period before the first exam, 10.8 percent before the second exam, and 11.2 percent before the third exam. For the no-policy class, absenteeism gradually increased, averaging 13.8 percent, 21.4 percent, and 27.2 percent, respectively, for the three exam periods.

**TABLE 1. Characteristics of Policy and No-Policy Classes**

Variable	Policy class		No-policy class	
	Mean	S.D.	Mean	S.D.
Age	20.4	1.80	20.4	2.06
Hours worked	17.6	13.66	18.5	13.09
Credit hours	15.6	1.61	14.8	1.81
GPA	3.01	0.54	3.06	0.61
On-campus resident	0.17	0.38	0.17	0.38
Local resident	0.73	0.45	0.60	0.49
Number of students	39		38	

To measure the impact of an attendance policy on absenteeism, I estimated a probit equation. The dependent variable, ABSENT, was coded as 1 if the student was absent during a particular class meeting and 0 if the student was present. The key independent variable was NOPOLICY, a dummy variable equal to 1 if the student was enrolled in the class with no mandatory attendance policy.

The remaining independent variables controlled for other factors that might account for a student’s absence. Several variables (the average number of weekly hours at a job, the number of credit hours the student was enrolled in, and whether the student lived on campus or in town) attempted to control for the student’s opportunity cost of attending class. Other variables (age, GPA) attempted to control for the students’ maturity and dedication to academics. The list of independent variables appears in Table 2.

I estimated separate absenteeism equations for each exam period (Table 3).<sup>5</sup> Although the difference in absenteeism between the two sections was not significant during the period before the first exam, the no-policy class exhibited significantly more absenteeism during the periods before the second and third exams. Holding constant the other independent variables, the lack of an enforced attendance policy resulted in daily absenteeism increasing by 6.8 percent during the period before the second exam and by 14 percent before the third exam.<sup>6</sup>

**The Marginal Effect of Absenteeism on Student Learning**

In the second component, I measured the marginal effect of absenteeism on exam performance. I prepared multiple-choice exam questions after each class lecture in the fall 2002 semester. This allowed me to identify the precise dates the corresponding exam material was covered. I also logged the exact dates each student missed class, and could thus ascertain whether a student who missed an exam question had been absent on the day the material was covered.

TABLE 2. List of Independent Variables	
Variable	Description
AGE	The age of the student
GPA	The student’s cumulative grade point average
ONCAMPUS	A dummy variable equal to 1 if the student lived on campus
LOCALRESIDENT	A dummy variable equal to 1 if the student did not live on campus but lived in town
CREDITHOURS	The number of credit hours the student was enrolled in that semester
WORKHOURS	The average number of hours the student worked at a job in a given week during the semester
WEDNESDAY	A dummy variable equal to 1 for a Wednesday class
FRIDAY	A dummy variable equal to 1 for a Friday class
NOPOLICY	A dummy variable equal to 1 if the student was in the section without a mandatory attendance policy

**TABLE 3. The Effect of Attendance Policy on Absenteeism**

Variable	Exam I		Exam II		Exam III	
	$\beta$	<i>t</i> statistic	$\beta$	<i>t</i> statistic	$\beta$	<i>t</i> statistic
CONSTANT	-0.980	-1.02	-1.48	-1.42	0.096	0.093
WEDNESDAY	0.200	1.41	-0.016	-0.102	-0.006	-0.046
FRIDAY	0.290	2.03**	0.417	2.94*	0.255	1.92***
AGE	-0.015	-0.482	-0.045	-1.41	-0.083	-2.56**
GPA	-0.122	-1.16	0.144	1.28	-0.281	-2.71*
WORKHOURS	0.005	1.04	0.021	4.23*	0.007	1.53
CREDITHOURS	0.013	0.343	0.012	0.331	0.062	1.77***
ONCAMPUS	0.364	2.22**	0.237	1.34	0.215	1.31
LOCALRESIDENT	-0.043	-0.326	-0.122	-0.880	-0.033	-0.246
NOPOLICY	0.055	0.478	0.420	3.37*	0.714	6.16*
Log likelihood	-323.3		-296.4		-354.9	
No. of observations	852		734		782	

Note: Dependent variable was ABSENT.

\*.01 Type I error level. \*\*.05 Type I error level. \*\*\*.10 Type I error level.

To identify the effect of absenteeism on exam performance, I estimated a probit equation in which the dependent variable, RESPONSE, was coded as 1 if the student answered incorrectly to an exam question and 0 if the student responded correctly. To determine the “pure” effect of absenteeism, I assigned student-specific dummy variables to each student to control for all external factors that might influence a student’s exam performance (i.e., motivation, intellect, study habits, etc.). Because some exam questions may be more challenging or ambiguous than others, I similarly assigned dummy variables to each question. The model took the following form:

$$RESPONSE_i = \beta_0 + \beta_1 ABSENT_i + \sum_{j=1}^n \beta_2 STUDENT_{ij} + \sum_{k=1}^m \beta_3 QUESTION_{ik} + \varepsilon_i, \quad (2)$$

where  $RESPONSE_i$  is an unobservable latent variable that was assumed to be normally distributed, and  $ABSENT_i$  is a dummy variable equal to 1 if the  $i$ th student was absent during the corresponding class period.  $STUDENT_{ij}$  is a dummy variable equal to 1 if the  $i$ th student took the identity of  $j$ .  $QUESTION_{ik}$  is a dummy variable equal to 1 if the  $i$ th student was answering question  $k$ . And  $\varepsilon_i$  is the normally distributed error for the  $i$ th student.

As the data in Table 4 indicate, a student who missed a given class period was significantly more likely to respond incorrectly to multiple-choice exam questions corresponding to material covered that day in class than were students who attended class. On the basis of the mean values for the independent variables for each of the three exams, an absent student was 9 percent, 12.8 percent, and 14

**TABLE 4. The Effect of Absenteeism on Exam Performance (No-Policy Class)**

Variable	Exam I		Exam II		Exam III	
	$\beta$	<i>t</i> statistic	$\beta$	<i>t</i> statistic	$\beta$	<i>t</i> statistic
CONSTANT	0.719	2.13**	0.744	2.19**	0.058	0.161
ABSENT	.260	2.10**	.320	2.26**	.3075	2.33**
<i>n</i>	1140		990		900	
Log likelihood	-584.6		-493.3		-480.2	

*Note:* Mean of incorrect responses were: Exam I = 34.6; Exam II = 40.2; Exam III = 45.6. Dependent variable was RESPONSE.

\*\* .05 Type I error level.

percent, respectively, more likely to respond incorrectly to corresponding exam questions than was a student who was not absent before each of the three exams.<sup>7</sup>

Before combining the results of the two estimations, I addressed the possibility that the slope coefficients for the no-policy class in the exam performance estimation may not have been the same as what might have been estimated had the policy class taken the same three exams. If greater absenteeism produces significant spillover effects (i.e., a student was present during a given class period but responded incorrectly to exam questions because of previous absences), the slope coefficient for the no-policy class might be larger than for a policy class. To see if the marginal effect of absenteeism on the likelihood of an incorrect response differed between policy and no-policy classes, I administered the same exams to all three principles of macroeconomics classes I taught in the fall 2002 semester. The 12 o'clock section did not have an attendance policy, but the other two sections (MWF 10:00 and MWF 2:00) were subjected to the policy.<sup>8</sup> I reestimated the equations in Table 4, subject to the restriction that the coefficients on the absenteeism variable in the policy and no-policy equations were equal. The null hypothesis could not be rejected at conventional levels of confidence. This suggested that the relationship between a class absence and the likelihood that a student would respond incorrectly to a relevant exam question was the same with or without an attendance policy.

### **The Marginal Effect of an Attendance Policy on Performance**

Because the coefficient restrictions in the Table 4 estimations revealed no difference between the absenteeism coefficients in the policy and no-policy sections, the absenteeism coefficient from the fall 2002 no-policy section could be combined with the estimates from Table 3 to assess the effect of the attendance policy on student performance.<sup>8</sup>

Although the attendance policy had virtually no effect on student performance in the first exam, the lack of an attendance policy increased the likelihood that a

**TABLE 5. The Marginal Effect of the Attendance Policy on Student Performance (Percentage)**

Exam	Increased likelihood of missing a class because of no policy	Increased likelihood of incorrect response because of absence	Increased likelihood of incorrect response because of no policy
I	0.7*	9.0	0.06
II	6.8	12.8	0.87
III	14.0	14.0	1.96

\*Not statistically significant.

student would respond incorrectly to an exam question by 0.87 percent on the second exam and by 1.96 percent on the third exam (Table 5).

## CONCLUSION

The body of literature clearly indicates an inverse relationship between absenteeism and student performance. Romer (1993), in concluding that absenteeism was rampant in undergraduate economics courses, raised the question, "Should attendance be mandatory?" The results of this study support Romer's contention that a significant link exists between absenteeism and learning. Students who were absent during a class period were 9 to 14 percent more likely to respond incorrectly to a question pertaining to material covered in their absences than were students who were present. In the absence of a mandatory attendance policy, absenteeism rose continually throughout the semester. By the final third of the semester, the daily percentage of students who were absent in the no-policy class more than doubled. In sharp contrast, daily absenteeism in the policy class remained fairly constant throughout the semester. Nonetheless, economic educators should note that whereas the relationship between a mandatory attendance policy and learning is statistically significant, the impact does not appear to be substantial. During the final third of the semester, when the absenteeism gap between the policy and no-policy classes was greatest, a student in the no-policy class was only 2 percent more likely to respond incorrectly to the average multiple-choice test question than was a student in the policy class.

## NOTES

1. The students were aware that daily attendance was taken for the purpose of a study.
2. According to the *University Undergraduate Bulletin*, "Students enrolled in [2000 level courses] may during a semester miss no more than twice the number of lectures...that would normally be scheduled during a week. Students who miss more than the maximum number of freshman or sophomore level classes may be assigned a grade of F for the course." For the fall 2003 class, this meant any student who missed more than six class meetings would fail the class.
3. The students did not know in advance whether their section would have an enforced attendance policy. Consequently, students were not able to self-select between the sections.
4. The number of students enrolled in the policy and no-policy classes at the beginning of the semester were 39 and 38, respectively. By the end of the semester, 34 policy students and 34 no-policy students were still enrolled in the course.

5. There were 12 class meetings during the period prior to the first exam, 11 class meetings during the period prior to the second exam, and 12 class meetings during the period prior to the third exam.
6. Becker and Powers (2001) noted that sample selection bias could influence the empirical results. If students with high absenteeism in the enforced policy class are forced to withdraw, the impact of the attendance policy on absenteeism will be overestimated. In this study, however, the average number of absences for students who dropped the course in the policy class did not differ significantly from the number of absences logged by students who dropped the course in the no-policy class. Moreover, a probit analysis revealed no relationship between a student's decision to drop the course and the number of absences accumulated by the drop date.
7. The coefficients produced in this study are quite similar to those uncovered by Marburger (2001). In his probit estimation of a principles of microeconomics class, absenteeism increased the probability of an incorrect response by 14.6 percent, 14.4 percent, and 7.5 percent on the three exams, respectively.
8. I also performed a probit analysis of absenteeism in the 10 and 2 o'clock classes. It revealed that absenteeism was, indeed, endogenous to the time the class met, necessitating the multi-semester experiment used in this study. The results of these estimations are not reported in this article but are available from the author upon request.

## REFERENCES

- Becker, W. E., and J. R. Powers. 2001. Student performance, attrition and class size given missing student data. *Economics of Education Review* 20 (August): 377–88.
- Durden, G. C., and L. V. Ellis. 1995. The effects of attendance on student learning in principles of economics. *American Economic Review Papers and Proceedings* 85 (May): 343–46.
- Marburger, D. R. 2001. Absenteeism and undergraduate exam performance. *Journal of Economic Education* 32 (Spring): 99–109.
- Park, K. H., and P. M. Kerr. 1990. Determinants of academic performance: A multinomial logit approach. *Journal of Economic Education* 21 (Spring): 101–11.
- Romer, D. 1993. Do students go to class? Should they? *Journal of Economic Perspectives* 7 (Summer): 167–74.
- Schmidt, R. M. 1983. Who maximizes what? A study in student time allocation. *American Economic Review Papers and Proceedings* 73 (May): 23–28.

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